



**Australian Government**

**Australian Taxation Office**

# **SINGLE TOUCH PAYROLL (STP) PAYEVNT Technical interactions Clarification on Partial File Rejection, SLA, File Size, Recovery Strategy**

This paper provides information to Digital service providers (DSPs) regarding four topics:

- Partial File Rejection
- SLA up to 72 hours
- File Size Management
- STP Service Recovery Strategy.

6<sup>th</sup> December 2017

Source: ATO-DSP Single Touch Payroll Technical Committee [STPTC@ato.gov.au](mailto:STPTC@ato.gov.au)

# Summary

Intent: Provide greater clarity to DSPs for development/ operation of STP.

## Background/context

Single Touch Payroll (STP) law was legislated on 16 September 2016, forming part of the Budget Savings (Omnibus) Act 2016.

As part of the Single Touch Payroll (STP) program of work, the ATO is committed to working with industry and end users to deliver services which work well in the community. The ATO acknowledges its contribution is part of a wider payroll process.

The ATO is working with DSPs on Single Touch Payroll to ensure smooth support for this new initiative.

Through a series of Design & Technical Working Group sessions a number of concerns have been raised by DSPs. This document aims to describe the agreed resolution to these concerns.

## Partial File Rejection

Rather than ensuring all messages in a lodgment are 100% valid, ATO will accept those messages it can. DSPs will then re-report the invalid messages in subsequent payroll runs or an update if necessary.

## SLA up to 72 hours

The ATO will process the Payroll lodgments within 72 hours. It will make channel validations available within minutes to single digit hours – depending on size.

## File Size Management

ATO will have infrastructure necessary to handle Payroll lodgments from the smallest to largest employers without impacting other SBR 2 workloads.

## STP Service Recovery Strategy

- ATO is improving its availability – smarter use of parallel environments.
- ATO is improving its resilience – eliminate/ reduce impact on consumers should environments become unavailable.
- In the event of unavailability DSPs need to be able to re-send lodgments at a later time.
- ATO is seeking input from community if there is anything they can naturally do to assist in recovery from an outage

## Scope

Partial File Rejection change is in scope to be addressed by Q1 2018, tentatively

- March 2018 for Prod,
- End Jan 2018 for EVTE & UATI (including conformance suites)
- artefacts required for build by end Dec '17 as per details on the [ATO eCommerce Schedules page](#)

Until these dates, the existing production solution remains in place.

It is probable that some of the availability work will spill over past Q1 2018.

## Design Considerations/ Principles

The ATO will collaborate and co-design with industry and end users to understand and deliver user-centric solutions.

Solutions need to support employers with differing levels of digital capability.

# Partial File Rejection

## What & Why



- For the Payroll Event lodgment, the ATO will introduce a new processing pattern for handling rejections.

The current approach for Payroll Events follows an all or nothing approach where all messages must be valid to accept the lodgment.

The proposed new pattern is to accept the Payroll Event lodgment if:

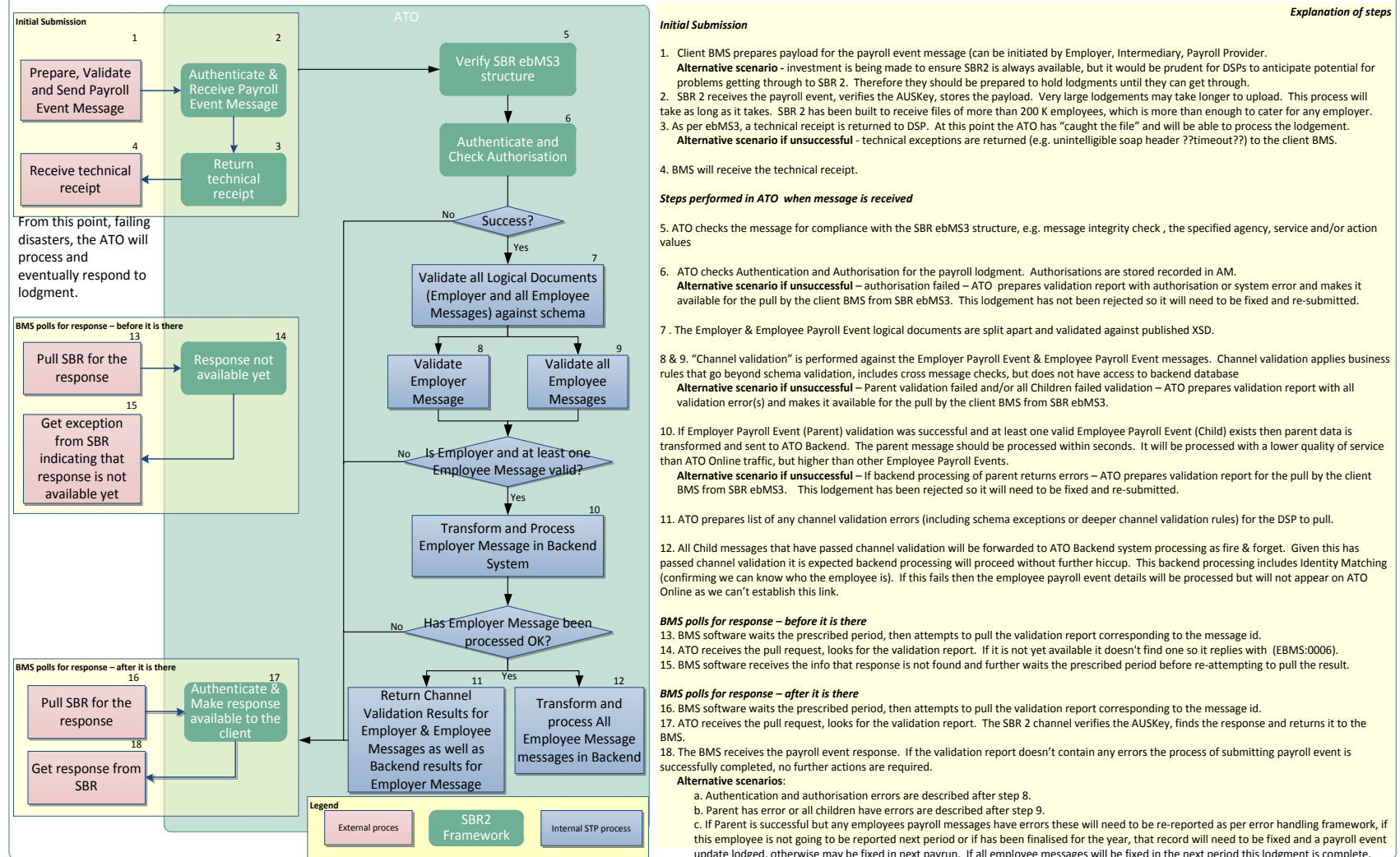
- Employer Payroll Event message is valid (both channel validation and backend processing) and
- at least one Employee Payroll Event message is valid.

### **This change is being introduced because:**

- It is inefficient and unproductive for stakeholders to have to resend valid & re-process Employee Payroll Event messages just because a sibling message has failed.
- With this new pattern DSPs will not even have to resend the failed messages from this payroll run, if circumstances are right they can just report the YTD figures in the next payroll run.
- Some DSPs pay a transmission and/or byte charge to send lodgments through gateways. Therefore having to re-process & re-send otherwise successful messages in a needless charge.

# Partial File Rejection

Lodgment is accepted if Employer message is valid and at least one Employee message is valid.

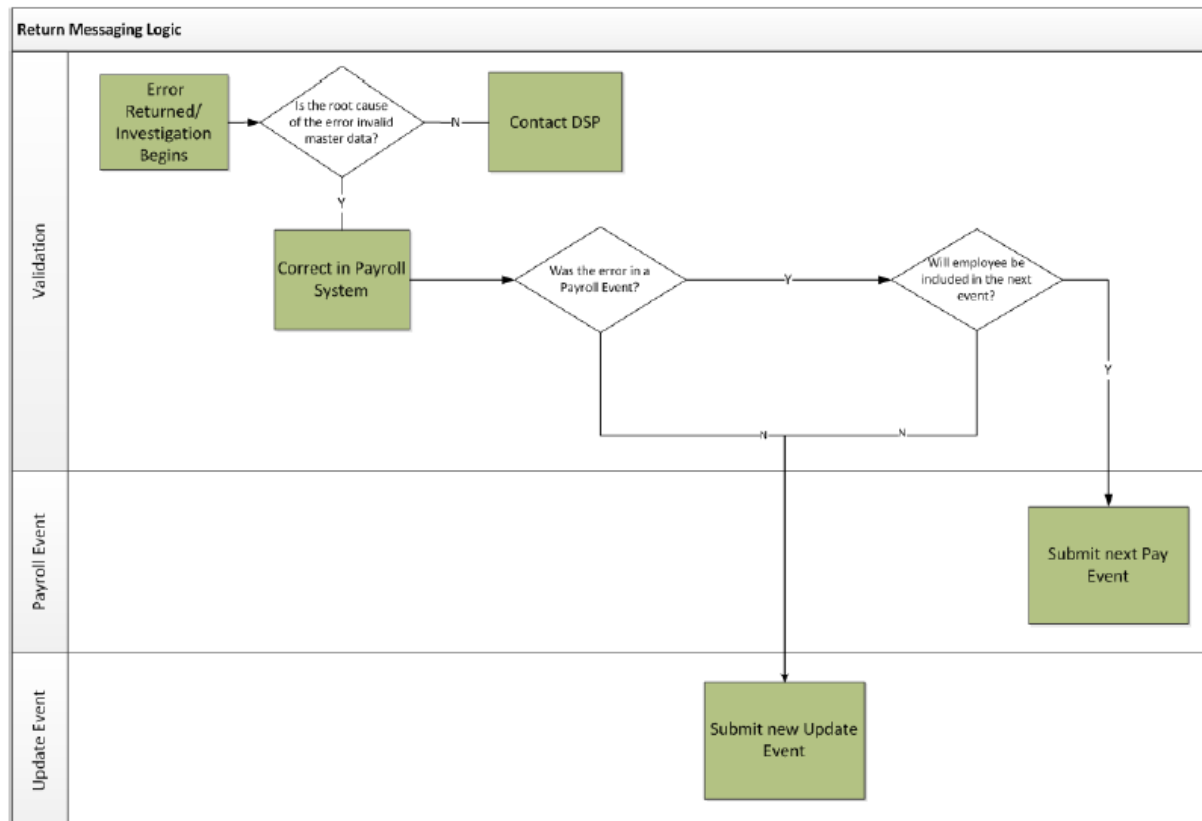


# Partial File Rejection - Context

How Business Management Software (BMS) responds to partial file rejection.

The following diagram and text is taken from section 4 of the [STP BIG](#)

*It is anticipated there will be minimal incidents of channel validation failures. DSPs are expected to address any issues of failure to validate, to ensure non-occurrence of rejected files. This is depicted in figure 4 below, which also provides the options available to payroll officers in the event of a return message.*



# Partial File Rejection – Main points to note

- **Lodgment will be rejected only if**
  - Employer Payroll Event message fails channel or backend processing, or
  - There is not a single Employee Payroll Events message that passes channel validation
  - (There is one of many other technical reasons – problems in transport, protocol, authentication, etc. – see below)
- **SBR returns a MaximumSeverity.Code value.** Currently, a value of SystemError or Error indicates the failure of the lodgment. This will now be augmented with an new possible value of “Partial”.
- **The error regime for SBR is complex**, it is described in section 5 of the [ebMS3 WIG](#). Figure 13 shows a summary of the different types of errors. The types of errors are:
  - Transport Exceptions (predominantly from green boxes on slide 4) – these errors may be further broken down:
    - ebMS errors (lodgment does not conform to ebMS 3), depending on where caught, these errors are provided as: HTTP Errors, SOAP Faults or ebMS error signals
      - Appendix A of the WIG contains the list of ebMS errors.
    - Agency messaging channel, like the next category of errors, these are send in Business Event message block
  - Application Errors (from blue boxes on slide 4) – these are payload specific errors, these are sent in Business Event message block.
    - The [ATO Message Repository](#) contains the list of over 7,000 errors in this category (fortunately most don't all apply to STP)
- **Actions to take on error:** Due to the complexity of the errors, it is not possible to easily and comprehensively describe what actions DSPs should perform when encountering an error.
  - *Generally*, if the Overall Business Event message block MaximumSeverity.Code contains SystemError or Error the lodgment will need to be fixed and resubmitted.
    - If it is a SystemError, the ATO may need to do the fix. Currently specific knowledge of error codes is required to determine who/ what fix is required. The ATO is aware of this and it is already on the Tax Agent Irritant list.
  - If the MaximumSeverity.Code contains “Partial”, DSPs will be responsible for inspecting individual Employee Payroll Event messages flagged as in error and will need to fix and resubmitted them – either in the next payroll run or in an update lodgment.
    - Each Employee Payroll Event messages in error is referenced in the response using the Record Delimiter

# Partial File Rejection – Main points to note

- **Count of Transactions may not match:** As this change means the ATO may now **partially** reject erroneous Employee Payroll Event messages, the count of the **transactions** in the **original submission** file may not match what is ultimately accepted.
- **Technical Receipts:** Once DSP have received a technical receipt for payroll lodgment they should expect ATO will process that lodgment regardless of any subsequent transient unavailability.
  - The ATO is further investing in the SBR 2 solution to eliminate data loss even in a disaster recovery scenario. Currently, inflight transactions are not replicated across data centres, so are at risk of loss. This is still work in progress.
  - The Technical receipt is returned immediately after delivery of message, minimal backend processing should get in the way of delivering this technical receipt.
  - If DSP doesn't receive a technical receipt immediately after delivering the message, they should assume the delivery failed.
- **Retention of Receipt messages:** In addition to getting [Recovery Point Objective](#) to zero, ATO is also making further investment in SBR 2 to make it highly available. Sadly, in our human realm, perfection is never achieved. So DSPs should be prepared for failure in lodging. This might be because of an ATO planned or unplanned (hopefully not) unavailability. Similarly, it might be because the failure is between the DSP & ATO. Therefore DSPs should have ability to “re-do” lodgments once issues are addressed.
  - It is not possible for the ATO to say how long DSPs may need to retain their messages before being able to perform a lodgment. The ATO is aiming for high availability (> 99.95%). So it is left to DSPs to assess how long they might need retain messages to re-send to deal with ATO unavailability.
  - Ideally, once a technical receipt has been received, DSPs shouldn't have to retain the message any longer (record keeping obligations aside). DSPs with experience in dealing with the ATO recant experiences of supplying files 6 months later.
- **Parent/Child Structure to remain:** ATO has considered whether, due to this change, it would be prudent to change away from the Parent/ Child structure for the Payroll Event. The impact of that change would be too significant, both for the ATO and DSPs and so the ATO will not be pursuing that change.
- **Matching failures** result in messages being posted against the employer record. Matching failures for TFND content generates correspondence to the employer. Once resolved will be transferred to employee. Currently no process exists to resolve payroll event matching failures. Currently this data is not viewable by employer or employees.

# SLA up to 72 hour– Main points to note

- Once a technical receipt has been received ATO SLA indicates the payroll event lodgment will be processed within 72 hours.
  - That is, no longer than after 72 hours (usually a lot shorter), employees should be able see payment summary on ATO Online.
  - After 72 hours DSPs should give up polling for a response and contact the ATO



- ATO anticipates the channel validation results should be ready to be pulled long before the 72 hours has elapsed.
  - If current performance tests are to be believed, the channel validation for even the largest lodgment will be ready within a couple of hours.
- Currently the [Common MIG](#) currently prescribes that DSPs should only attempt to poll for responses after 1 hour 10 seconds + 10 seconds/lodgment. For a 200K employee file this equates to 2,003,600 seconds or roughly 23 days. This guidance pre-dates STP volumes and the partial file rejection change (which includes responding before processing Employee Payroll Event messages through the backend).
  - The ATO will update the Common MIG to put special provisions in for STP. These provision will say response messages may be polled at the following frequency (after receiving the technical receipt).

Number of Employees	Initial Polling	Subsequent Polling	Fully Processed
Less than 100	1 Mins	After another 1 Minutes, and then every 5 Minutes	72 hrs
101-200	2 Mins	After another 2 mins, then every 10 mins	
201-1000	10 Mins	After a further 10 mins, then every 20 mins	
1000 & up	1 hour	After a further 30 mins, then every hour	

- The goal will be that at least 50% of the time the response will be available on the first poll. Given ATO is publishing these figures now, but ATO will not see how the system behaves under real load until post production, achieving this goal will require a degree of good luck.
- It is anticipated that in time the above polling times will be applied to other types of lodgments.
- ATO is giving consideration as to how it will enforce the above polling rate to prevent overuse by DSPs.



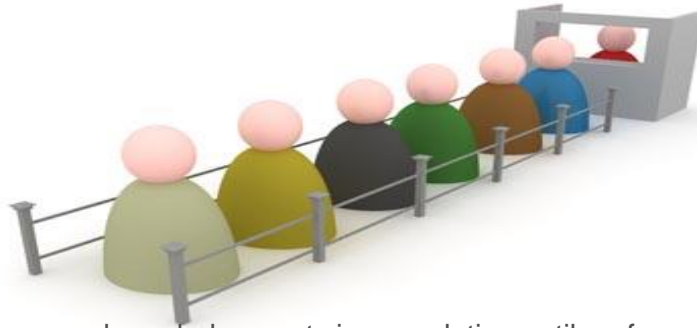
# File size management – Main points to note



- A [discussion thread on the ABSIA forum](#) highlighted the following concerns:
  - Time-out periods for uploading large lodgments over slow network connections
  - ATO ability to hold large lodgments
  - Suitability of XML for large documents.
  - Suitability of STP data for compression
- The ATO will size and tune its systems to handle more than the largest possible lodgments; this is currently understood to be 200K employees. In general, the SBR infrastructure has been specified to handle lodgments many times larger than 200K employees
  - Currently, in prod, SBR2 handles messages of 380 K (~ 2.5 Gb raw content) – this takes 8 hrs
- There is no issue on the ATO side about waiting for upload timeframes. SBR2 will wait as long as it takes to receive large files.
- Internal ATO SBR2 performance testing has demonstrated it can process a 200k employee file – specified as XML. In general XML data is a good candidate for compression.
- So from an ATO perspective, we believe we are on track to handle a single lodgment as large as any employer will send us; so nothing special will need to be done to artificially break this lodgment up.
- We recognise that from a “sender” point of view, they too will need to have infrastructure capable of constructing and sending lodgments of this size. We assume that by the time an Employer gets to this size they will be used to dealing with this kind of infrastructure need.
- If for some reason employers do wish to break up lodgments they may do so by either:
  - having different payment dates
  - having different branches
  - having different BMS IDs.
- If feedback from employers/ DSPs is they want to break lodgments up but don’t want to use one of these mechanisms, modification to the message design will be required. No options for an alternative break-up approach are proposed – pending identification of the need.

# File size management – Main points to note

- A technical focus group discussion also identified a concern that small lodgments (STP, PLS or Super) may get stuck behind a large STP lodgment.
  - The ATO was asked to consider making DSPs split large lodgments into smaller ones.
  - The concern being that SBR 2's machine resources (CPU/ Memory/ etc) may be consumed on large lodgments.



- ATO expressed the view that concern over large lodgments is speculation until performance testing highlights problem. (as at Oct '18)
  - This is a high focus activity in the ATO.
  - SBR 2 is a multi-server (currently 40+), multi-threaded environment – it will be possible to tune it.
  - There is consideration for providing a dashboard to show workload information about SBR 2 to externals. Feedback has been received that while such a dashboard would be useful/ reassuring, it would be unrealistic to expect DSPs/ Employers to hold off submitting a lodgment because they see that the system is “under load”. DSPs should be prepared for the possibility that they cannot upload a file now and will need to resubmit later. This suggests DSPs should have their own queues and be able to resubmit when necessary.
  - For XBRL lodgments there is an upper size. XBRL imposes a need to chop-up lodgments as with XBRL it is possible the last byte of a document can affect very start of a document; thus the whole thing must be held in memory. For B2B there is a limit of 10K logical docs, for B2G the record delimiter essentially means a single logical document per XBRL document. This constraint doesn't exist with plain XML used by STP; although the record delimiter solution is also applied to XML.
  - It is possible for payroll providers to submit a transmission as a batch of bulk payroll events. While not mandated, it probably makes most sense to only have one employer in a transmission (see submission guidelines in [CMIG](#)).

# STP Service **recover** strategy– Main points to note



- The ATO is currently pursuing two courses of action:
  - Work to improve the availability of its solutions, including dependent systems. This includes tasks such as: parallel deployments to the cloud, upgrading databases to utilize “Always On Availability Group”, reviewing load balancing & DevOps processes, capacity planning, etc.
  - Work to address resilience – this is defined as minimizing impacts should availability problems occur. This includes: responding off cached data (where possible / appropriate), storing and holding lodgments until return to service, improved queuing strategy so requests always get through.
- The ATO has engaged the services of a consultancy to prepare a program of work to address the above. It is recognised this is all just plan for a plan at the moment. It will take time for this program to deliver results. The ATO is focused on predicted STP workloads.
- The ATO recognises some, but not all, lodgments can be held by the DSPs in the event of outages.
  - It is yet to be fully explored what options exist for the community to assist and not exacerbate the problems resulting from an outage. This is where external feedback on service availability may help.
  - The ATO is pursuing a “catch a file” approach, so that if all else fails, we can at least get the file and return the technical receipt. But as mentioned under partial file rejection, DSPs still need to cater for ATO unavailability and have the ability to resend.
  - DSPs are asked to consider the implication of their participation in this world of high volume exchange and consider things such as: restarting/ replaying lodgments, keeping various ids, persisting (potentially redundantly) keeping lodgements

# Document control

## STP Technical Committee

### Focus group members for these issues

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## Version control for this document

Date	Version	Description
6 October 2017	0.1	Initial Draft
10 October 2017	0.2	Updated with internal review feedback
19 October 2017	0.3	Reviewed with Technical focus group
26 October 2017	0.33	Tabled at ATO-DSP STP technical Focus Group
30 November 2017	0.33	<a href="#">Endorsed at ATO-DSP technical focus Group as 20171130 STP Performance Concept Paper (PPTX)</a>
21 December 2017	1.00	Formatting changes for ATO corporate standards: "STP_PAYEVNT_Technical_interactions_clarification_on_Partial-File-Rejection_SLAs_File-Size_Recovery-Strategy.PPTX"
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